THE IDENTITY OF MICROCYCAS CALOCOMA

OTIS W. CALDWELL AND C. F. BAKER

(WITH THREE FIGURES)

The important discoveries made in the Cycadales within the past decade led the first author to desire to secure material for a morphological study of Microcycas. During March and April of 1905 an abundance of staminate and carpellate cones as well as vegetative material of a small cycad said to be *Microcycas calocoma* were collected in Cuba. It was questioned immediately whether this material did not belong to Zamia. A careful comparison with herbarium specimens and an examination of literature soon led to the conclusion that it was *Zamia pumila*. Later investigation fully confirmed this conclusion and showed that it has been wrongly called *Microcycas calocoma*. Specimens of what is probably *Zamia pumila* have been issued several times from the New York Botanical Garden as *Microcycas calocoma*, the specimens coming from Madruga (*Britton* and *Shafer* 638 and 803) and from Matanzas.

In January and February 1907 a second attempt was made to locate and collect material of *Microcycas calocoma*, this excursion resulting more successfully than the first. In the higher regions of the Sierras of western Cuba a number of groups of the plant were found, also both staminate and carpellate cones. The confusion that exists in reference to the genus and the incompleteness of published accounts make desirable a somewhat full account of its bibliography and characters.

The earliest description discovered is that of MIQUEL in VAN HOUTTE'S *Fl. Serres et Jard.* (**7**:141. 1851–52), under the title "Sur une espèce nouvelle de Zamia des Indes occidentales, introduite dans l'etablissement Van Houtte, à Gand." Although he gave this plant the name *Zamia calocoma*, in this same connection he suggested that there be made for it a new section of the genus, to be called Microcycas. In a note preliminary to the description MIQUEL says that this plant constitutes quite a distinct species, near *Z. tenuis*

Willd., but differing from it in the form and number of the leaves. In this character MIQUEL says that *Z. calocoma* surpasses all other species of the genus, and "rappelle parfaitement le port d'un petit *Cycas revoluta*." MIQUEL's description is as follows:

Zamia calcoma Miq. Frondibus adultis glabris, pinnis densis numerosissimis, utrinque 65–70, coriaceis linearifalcatis subacutis integerrimis, marginibus leviter incurvis, utrinque tenere nervoso-striulatis, nitidis.—Sectio nova: *Microcycas*.

Adumbratio speciminis in Horto Amstelodamensi culti.

Truncus 10 poll. altus, basi 4½ crassus, subconicus, simplex vel bifidus, fere totus esquamatus, cortice hic illic lenticelloso-pustuloso, pallido, superne perulis coriaceis sensim rigescentibus lanceolatis acuminatus ochraceo-griseo-tomentosis, glabrescentibus, circa frondium comam obvallatus. Frondes nunc undecim, erecto patentes. Stipes subtrigono-cylindraceus vel ferme cylindricus, antice non vel obsoletissime sulcatus, 3–4 poll. longus, calamum scriptorium crassus, juvenilis villo arachnoideo tenui tectus, adultus glaberrimus. Rhachis 1¼–1½ pedalis, rectiuscula vel flexuosa, subsemitereti-trigona, dorso valde convexa, antice interpinnas in angulum obtusum prominens, sulco utrinque pro inserendis pinnis haud profundo, apice in brevem mucronem incurvulum vulgo quidquam pilosum exserta. Foliola articulatione mox pallescente subtumidula inserta, senescentia seorsim decidua, media longiora quam superiora et inferiora (hinc tota frons lanceolata fere), omnia densa, pleraque alterna vel superiora subopposita aut opposita, horizontaliter patentia, saepe retrorsum arcuato-curvata, 3–11 in. distantia, infima paulo distantiora, linearia, rigidule coriacea, fere omnia falcata, supra saturate viridia, laevia, nitida, facie plana vel leviter canaliculata, subtus pallida, marginibus praesertim versus basim leviter recurva, utrinque tenere striata nervis parallelis in medio 12, versus, apicem folioli saltem 5, saturate viridibus: omnia integerrima: media 4 poll. longa vel aliquid longiora, 1½–1⅔ lin. lata. In plerisque frondibus utrinque 60–70 foliola numerantur.

In *Gartenflora* (**6**:16. *pl. 186. fig. 30.* 1857) REGEL mentions *Zamia calocoma*, but with no description. In 1857, however, he gives a brief description (Bull. Soc. Nat. Mosc. **1**:191), based upon a specimen of *Zamia calocoma* which he says was brought from Cuba by CHAPPY. In addition to the characters given by MIQUEL, REGEL adds that the stem is one to two feet high and shows for a long time the markings left by the successive crowns. He also states that dormant buds appear on the stem. In closing he says that this plant varies so widely from any Zamia that it may constitute a new genus, and that he hoped his specimen would soon flower and thereby enable him to decide the question.

GRISEBACH (Cat. Pl. Cub. 217. 1866) refers to a further collection

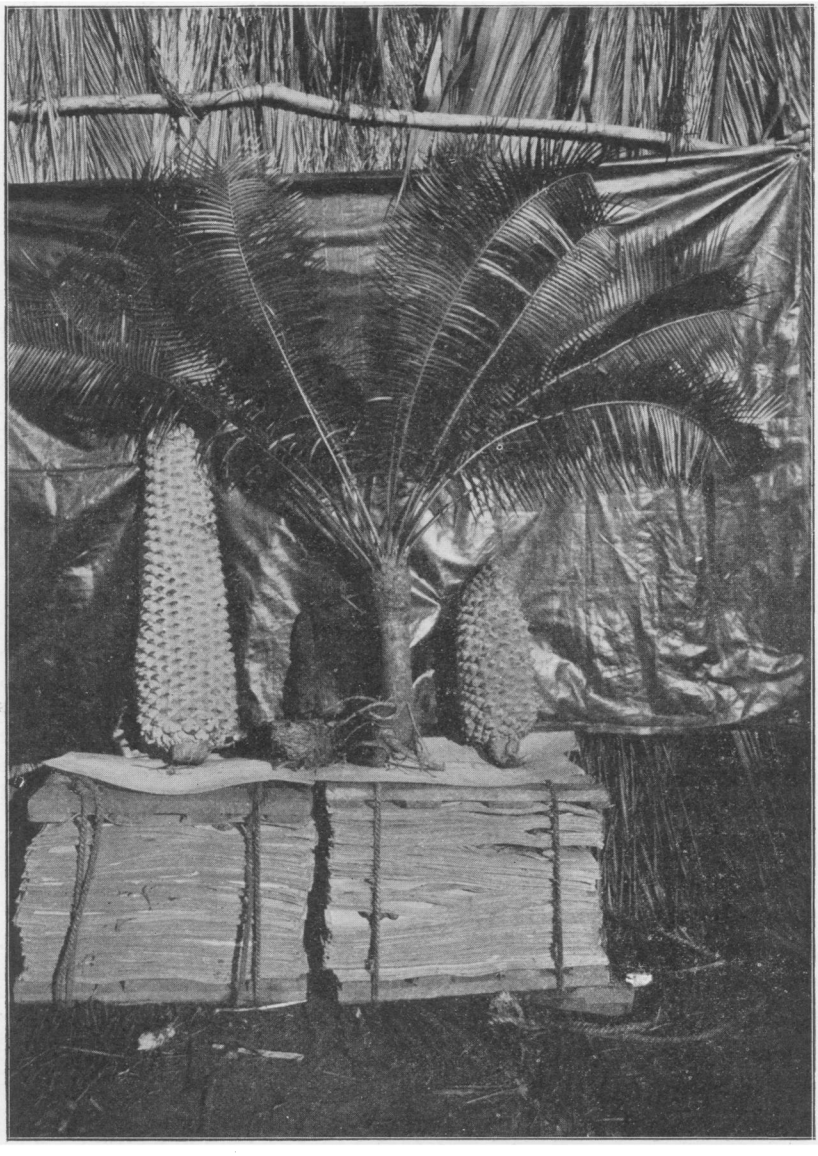

FIG. 1.—A young plant, two ovulate cones, one staminate cone (standing at right of left-hand cone), and terminal bud (at base of staminate cone); comparative sizes are shown by herbarium driers used as support for specimens.

by WRIGHT as follows: "*Zamia calocoma* Miq. (*Wr.* 3193: foliola pleraque 8″ longa 4″ lata; squamis ad *Z. Brongiartii* Miq. accedit)."

In DE CANDOLLE'S *Prodromus* (**16²**:538. 1868) there appears the first full account of Microcycas as a distinct genus, the description being based upon previous descriptions and upon material collected by WRIGHT. From this we make the following excerpts:

Squamae strobili masculi planae, imbricatae? crassiusculae, a basi ad mediam partem cuneatae et subtus crebre loculigerae, a medio ovatae, steriles. Squamae strobili feminei laxe juxtapositae, axi perpendiculares, superiore majore parte drupam irregulariter sulcatam simulante, nempe ellipsoideo-costatae et sulcatae, extremitate truncata vel obtusa, inaequaliter (in sicco?) bullata, basi in stipitem brevem angustata, stipite utrinque in apice semen ellipsoideum sessile gerente.—Arbuscula Antillana; trunco humili . . . . nunc fructificatione cognita, genus inter Dioon et Zamiam apparet, a priore diversum foliolis basi segregatis et articulatis, squamis femineis pinguibus, apice contundatis et seminibus ut vulgo sessilibus; a Zamia, squamis masculis planis, non peltatis, femineis pelta multo longiore.

Under the description of the species (*M. calocoma* (Miq.) A.DC.) the following statements appear:

Strobili masc. forma mihi ignota. Squamae (segregatae) 18–20 mill. longae, 9–10 mill. medio latae; parte fertili centim. longa, supra glabra, subtus undique loculis vestita; parte sterili cinereo-tomentosa, supra in nervum crassum medio inflata. Strobilus femin. 2 decim. longus, cylindricus? (in specimine sectus), pedunculo cinereo-tomentoso brevi? suffultus. Squamae 2 cent. longae, stipite 4–5 mill. longo, reliqua parte 15 mill. longa, 9–10 mill. lata, costis irregularibus látere sup. magis convexo, apice aut, planiusculo subquadrangulo, aut contundato-sinuoso, pallide pilis stellatis tomentoso.

BENTHAM and HOOKER (Gen. Plant. **3**:447. 1880) give an incomplete and imperfect characterization of the genus, and incorrectly cite the name of the species as *cubensis*.

From the above descriptions it is clear that our material is *Microcycas calocoma;* but it is also evident that the specimens used as a basis of these descriptions were far from being fully representative. There are two specimens of *Wright* 3193 in the Wright-Sauvalle herbarium, one of which possesses a young fruit. This is the number cited and described by DE CANDOLLE, and is identical with our own collections.

The following description is based upon our material:

Stem 25^{cm} to 10^{m} high, $1–6^{dcm}$ in diameter, often branched; bark

smooth or ridged, usually with conspicuous leaf scars; cross-section showing a thick cortex, a single vascular cylinder, and pinkish, brittle, starch-bearing pith: leaves 0.6 to 1^{m} long, 6–40 in the crown; petioles

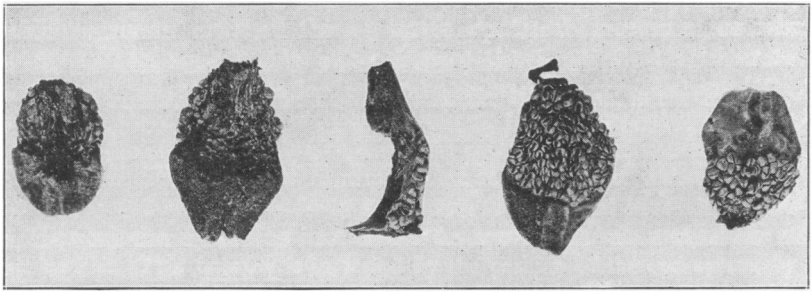

FIG. 2.—Staminate sporophylls; the two at the left show the adaxial surface, the two at the right the abaxial surface, the middle one a lateral view.

1^{dcm} long, terete, with shield-like base; leaflets 50–80 pairs, 8–12^{cm} long, opposite or alternate, attached by an entire calloused base, finely villous when young, glabrous and glistening when mature, bright

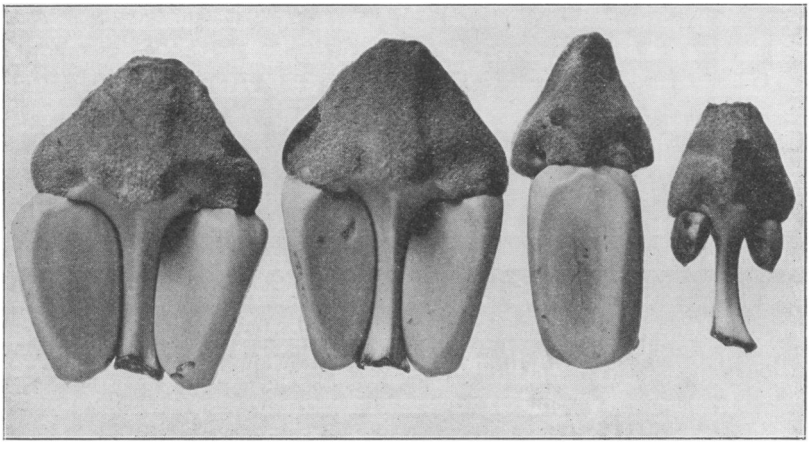

FIG. 3.—Ovulate sporophylls, showing (beginning at the left) abaxial view, adaxial view, lateral view, and abortive ovules.

green, with 15–20 dichotomously branching veins (reduced to 6–8 at the tip), bluntly pointed, tips turning inward slightly, margin slightly revolute: bud scales 4–6^{cm} long, 1.5–2^{cm} wide, often twisted at tip,

densely tomentose (except on lower half of inner face) with long gray hairs: staminate cone 25–30^{cm} long, 5–8^{cm} in diameter, cylindrical, on a short densely tomentose peduncle; sporophyll 2–2.5^{cm} long, 1.5–2^{cm} wide, the basal two-thirds of the abaxial surface densely covered by sporangia, the apical third gray-tomentose and prominently ridged along the median line, obtusely pointed: ovulate cone 50–70^{cm} long, 13–16^{cm} in diameter, cylindrical, slightly tapering from base to tip, obtusely pointed, on a short densely tomentose peduncle which together with the base of the cone is covered by densely tomentose scales 6–10^{cm} long; sporophyll 4.5–5.5^{cm} long, 3–4^{cm} wide, 2–3^{cm} thick, with stalk 3–3.5^{cm} long and perpendicular to the axis of the cone, the outer portion quite convex, usually four-ridged, the apex blunt, sub-quadrangular, and sometimes furrowed, the entire outer portion of the sporophyll covered by a dense mass of closely appressed grayish hairs; ovules two, pink, 3.25–3.5^{cm} long, 1.25–1.75^{cm} thick (*figs. 1–3*).

STATE NORMAL SCHOOL, CHARLESTON, ILL.
ESTACIÓN AGRONOMICA, SANTIAGO DE LAS VEGAS, CUBA